{In Archive} Fw: ISL TCEQ Correspondence

Jose Torres to: Larry Wright, Philip Dellinger, Ray Leissner 06/30/2008 11:44 AM

From: Jose Torres/R6/USEPA/US

To: Larry Wright/R6/USEPA/US@EPA, Philip Dellinger/R6/USEPA/US@EPA, Ray Leissner/R6/USEPA/US@EPA

Archive: This message is being viewed in an archive.

Gentlemen: FYI

Mr. Mark Krueger, the gentleman who owns land near the proposed mining site in Goliad County, sent me the attached information, which contains several "question-answer" exchanges between he and state officers, and comments from another gentleman who appears to be his consultant. The discussions revolve around the issue of qualifying an aquifer for an exemption, and the possible effects of drilling uranium exploratory wells and of the in-situ solution mining operations on the aquifer. I thought you might wish to take a look at this.

JETorres

----- Forwarded by Jose Torres/R6/USEPA/US on 06/30/2008 11:25 AM -----

"Mark Krueger" <markkrueger@wildblue.net>
06/26/2008 08:21 PM

To Jose Torres/R6/USEPA/US@EPA
cc
Subject ISL TCEQ Correspondence

Mr. Torres,

Thank you for your prompt reply.

The email titled Nelson/Abitz is a letter I sent to Katherine Nelson with TCEQ, her responses to that letter (in **bold black**) and also a commentary by Dr. Richard J. Abitz, PhD (in blue). I contacted Dr. Abitz some six months ago regarding this situation, as he is an expert in the field of uranium mining. Since that time, he has travelled here twice to help the citizens of South Texas to understand ISL uranium mining and its potential effects. I have also included some direct correspondence from Dr. Abitz and also one from David Gunn with TDLR, indicating that wells in this area can be interconnected and can influence and affect one another.

Thank you for your attention in this matter.

Mark Krueger
939 Noll Road
Meyersville, Texas 77974
(361) 485-1910

----- Message from "Richard Abitz" <rabitz@cinci.rr.com> on Fri, 16 Nov 2007 09:04:03 -0500 -----

To: "'Mark Krueger'" <markkrueger@wildblue.net>

Subject: RE: Goliad Project Permit # UR03075

Please see blue text… my comments on their comments.

From: Mark Krueger [mailto:markkrueger@wildblue.net]
Sent: Thursday, November 15, 2007 3:47 PM
To: tim.andruss@vcgcd.org; 'Kenneth Schustereit'; kjanak@vctx.org; 'Richard Abitz'; 'Art Dohmann'; dmarkmeek@yahoo.com; mckenzie@sandramckenzie.com; marutherford@sbcglobal.net; calhoun@goliad.net; jbb@blackburncarter.com
Subject: FW: Goliad Project Permit # UR03075

From: Katherine Nelson [mailto:KNELSON@tceq.state.tx.us]
Sent: Thursday, November 15, 2007 1:37 PM
To: Mark Krueger
Cc: Ben Knape; Bryan Smith; David Murry
Subject: Re: Goliad Project Permit # UR03075

Mr. Krueger,

Thank you for your November 12, 2007 email to me. I have reviewed your questions and had them reviewed by staff working on the UIC uranium applications. Responses to your questions and comments are provided below in bold type. If I can be of further assistance, please contact me a (512)239-6622 or the e-mail address provided below. You may also contact David Murry of my staff at (512)239-6080 or dmurry@tceq.state.tx.us

Sincerely,

Katherine Nelson, Manager
Industrial and Hazardous Waste Permits Section
Waste Permits Division
knelson@tceq.state.tx.us

>>> "Mark Krueger" <markkrueger@wildblue.net> 11/11/2007 9:49 PM >>>
Kathryn,

I'd like to introduce myself. My name is Mark Krueger. I happen to be Bob Krueger's cousin, but that's not why I'm writing you.

It's my understanding that when the Texas Railroad Commission approves an exploratory permit (specifically uranium), the permit allows the mining company to explore by drilling hundreds of holes into the ground in a relatively small area. It's also my understanding that the exploratory drilling does not require prerequisite water quality testing. **You are correct**

that permits for the drilling of exploration wells are issued by the Texas Railroad Commission (TRRC). Any questions regarding these permits should be directed to the TRRC, as they can best answer them. The TRRC can be contacted at (512)435-6900.

Once the exploratory drilling is complete, the mining company then takes water samples to establish a baseline, which will normally show that the water is "not fit for human consumption", and this is the basis for EPA, TCEQ and UIC to approve a mining permit. **Approval of a Class III Underground Injection Control well permit, which is issued by the TCEQ, depends on the applicant demonstrating in the permit application that the requirements in all applicable regulations have been met. There is no requirement for an applicant to demonstrate that the groundwater in an aquifer that contains an orebody is "not fit for human consumption." (This is a bit odd, as 'not fit for human consumption' is the basis for saying that the aquifer will not serve as a future source of drinking water. Clearly, all water that is fit for human consumption will be used in the future.) In order to mine an orebody using Class III injection and recovery wells ("in situ" mining), one of the many requirements is that the applicant obtain an aquifer exemption for that portion of the aquifer that is to be mined using in situ techniques. Two criteria must be met for an exemption is granted: The aquifer does not currently serve as a source of drinking water for human consumption, and until the exempt status is removed (I do not understand what is implied by 'until the exempt status is removed.' It seems to imply that the aquifer has already been given exemption status), the aquifer will not in the future serve as a source of drinking water for human consumption (It will not serve as a source of future drinking water if in situ mining occurs, because restoration to drinking water standards is not possible. . The groundwater from the zone for which an aquifer exemption is granted is not necessarily "unfit for human consumption", although typically the concentrations of uranium and radium 226 in the groundwater in the orebody exceed federal drinking water standards for those elements. (This is generally a fallacy that the mining companies sell to the regulators and the public. Uranium CANNOT exceed the federal drinking water standard in an UNDISTURBED ore zone because the minerals that form the uranium deposit are nearly insoluble (uranium below 0.010 mg/L) when oxygen is absent from the water. Likewise, radium is a decay product of the uranium and it is locked in the mineral structure with the uranium until it is disturbed. When oxygen enters the system during the exploratory drilling phase, the uranium ore starts to oxidize and becomes more soluble, releasing more uranium and radium into the water. If sodium chloride brines are used for drilling, the additional chloride contamination introduced into the water will enhance the solubility of radium and other metals.)**

Baseline water quality samples, the purpose of which is to determine the quality of the water in an orebody so that once in situ mining is complete the groundwater in the mined aquifer can restored to pre-mining quality, are usually collected after exploratory drilling is complete. This is because the location of the orebody must be determined in order to ensure the baseline wells are completed in the orebody. (This is another fallacy that is weakly argued. The completion of all exploratory drilling is not required to know the location of the ore body. Exploration starts out on a very large grid, with holes spaced perhaps 1000 ft apart. As the ore body is located, the grid collapses to a spacing of 400 or 100 ft to define the ore body in more detail. There is no good argument for waiting until

all exploratory holes are completed to establish baseline water quality. It is clear that the more holes punched into the ore zone, the more oxygen that is introduced to begin the dissolution of the uranium minerals.) Baseline water quality samples are not collected from exploratory wells, however. Baseline wells required for a Class III Underground Injection Well permit must be constructed and operated to yield samples that are representative of the groundwater from the zone in which the baseline well is completed. (This highlights another concern with exploratory drill holes, they are not subject to much oversight because they are logged and abandoned. The lack of oversight on the drilling materials used and the abandonment of the exploratory holes is another strong argument for establishing baseline quality before hundreds of holes are punched in the aquifer. I would ask the TRRC for the drilling specifications and materials used during the exploratory phase, but don't be surprised if they have no set standards for the companies.) Prior to any sampling, well casing is installed and cemented, with a well screen across the aquifer zone of interest. A gravel pack is placed between screen and the borehole to enhance the flow of groundwater from the aquifer into the well. Casing is pressure-tested for any leaks. Exploratory wells are not constructed to these standards and would not be used for baseline water quality sampling (although an exploratory well, once drilled, subsequently can be constructed to meet these requirements). Once casing is installed and tested, the well is developed, usually through water surging, to remove fine particles that may clog the screen. Before a groundwater sample is collected, the well is pumped for an appropriate period of time to ensure only fresh groundwater is sampled. (This discussion on how to sample a well to establish baseline water quality implies that the TCEQ has some procedure that the company must follow. Ask to see the procedure and also determine if the TCEQ has specific statistical methods that must be used to establish the baseline water quality. However, note that this response on how to construct a well for water-quality sampling does not address the more important issue of establishing baseline BEFORE the aquifer is disturbed. As noted above, the TCEQ is incorrect to assume that all exploratory holes must be completed before baseline can be established.) Class III wells can only be operated in an aquifer that has been exempted from being an underground source of drinking water. (As you note in your response to Kathryn, the aquifer is being used as a drinking water source. However, the TCEQ will probably support the mining company when they say that the ore zone is not used for drinking water and that is the only part of the aquifer that will be disturbed. This is a great fallacy, as the chemicals they inject into the ore zones migrate away from the ore zone and the monitor ring around there operations is not sufficient to catch all 'excursions' of mining fluids. I have additional comments on this below….see response to their comment on the monitor well ring that detects excursions before they reach your well….another fallacy.)

I don't mean to sound elementary, but doesn't it seem logical that if one were to stick a blender down into the ground, times hundreds, that the aggravated water may be less than optimal for drinking? Let's take two glasses of drinking water, and drop a "precipitated" element into both of them. Let's call the precipitated mass a "dirt clod". There may be some residual effect from the dirt clod, but the water will still remain drinkable, as long as the clod is not disturbed. After a substantial period of time, the sediment should totally come to rest, and the state of the water will be very close to its original state. Now, let's take glass #2, and put a drill bit down into it and turn the drill on. It will disturb the dirt clod, and turn the surrounding

water into mud. I would consider the mud "not fit for human consumption", as I'm sure the EPA would consider it the same. **There appears to be the misconception that baseline water quality samples are collected from the drilling mud in a borehole, or that the drilling mud used to drill the well invades the aquifer for a substantial distance from the borehole. (They missed the point of your discussion. I believe you are implying that drilling holes into the ore body disturbs the ore zone, and some cross contamination will occur from the drilling materials. You are not saying that drilling mud will circulate extensively in the formation.)Neither is true. In the Texas Gulf Coast area, wells, including water wells, are drilled using a rotary mud system. As the well is drilled, drilling mud, which is water and bentonite clay (bentonite clay commonly contains uranium; and if the clay is millions of years old, there will also be radium. This is the scientific concern for collecting water quality samples before hundreds of exploratory holes introduce contamination into the aquifer.), is pumped down the drill pipe, through the bit, and up the annular space between the drill pipe and the sides of the borehole. Certainly if this drilling mud were sampled it would not represent the quality of groundwater at that location. As explained previously, however, groundwater samples are taken from a well that has been properly constructed and developed to ensure that the sample is representative of the natural conditions of the groundwater. During drilling, water (called mud filtrate) from the drilling mud can invade the sediments penetrated by the borehole, while the solids in the mud (the bentonite clay) is deposited on the borehole wall, forming what is known as mudcake. The depth of invasion (referred to as the radius of invasion) of the mud filtrate into these sediments depends on the type of sediment (little to no invasion occurs in clays or shales), the difference in head (or pressure) between the groundwater in the aquifer and the head in the drilling mud in the borehole, and on the length of time this head differential in maintained. At the depths typical for uranium exploration wells in south Texas (usually about 400 feet or less), there is little head differential between the drilling mud in the borehole and the groundwater. Also, wells of this depth can be drilled in a few days, so any head differential only is maintained for a short time. Under these conditions, invasion of mud filtrate into the sediments penetrated by the borehole is minimal. (Again, a minimal amount of contamination from hundreds of exploratory holes changes the true baseline water quality. This is obvious to anyone who sits down and studies this problem. It is difficult to understand how the TRRC and TCEQ can support establishing baseline after the exploratory phase, as they supposedly have scientists on their staffs!)**

How can the EPA, the TCEQ and the State of Texas allow a mining company to disturb an aquifer to an extreme degree, then subsequently take water quality samples and state that the water is "not fit for human consumption"? Is it not comprehensible that the physical disturbance of a single sample well would alter the water quality, and to drill hundreds of holes would alter much of the surrounding groundwater? I am positive that if I were to run a water hose down into my well, circulating the water over and over, that my water properties would change. I wouldn't have to inject hydrogen peroxide or any other lixiviate into the water to get it to produce increased mineral levels. If I were to put an auger down into my water well, and rotate it thousands of times, I'm sure that my water quality would be less than optimal, and probably "not fit for human consumption". **Drilling muds used in the Texas Gulf Coast typically are made from fresh groundwater obtained locally, and therefore are chemically similar to the local groundwater, and essentially have no capacity for chemical interaction**

with the sediments in the aquifer. The only effect mud filtrate may have on the groundwater adjacent to the borehole is to perhaps dilute it somewhat within the radius of invasion. Even in deep oil and gas wells where a head differential exists between the drilling mud in the borehole and the water in a formation, and in which this head differential may exist for several weeks, the radius of invasion into a permeable zone typically a few feet at the most. (Again, a little contamination from hundreds of exploratory holes and the disturbance of the ore zone do change the baseline water quality.)

It appears that the Texas Railroad Commission allows such an act, being the permissive disturbance of underground water, prior to obtaining water quality samples from that aquifer. The water samples taken and tested for drinking water quality have then been manufactured, disturbed to the point of non-drinkablility. This is absolutely absurd. **As described previously, baseline wells must be constructed and operated in a manner such that the well will yield a sample that is representative of the groundwater in the aquifer. Baseline water quality samples are not collected from the drilling mud in an exploration well. Invasion of the mud filtrate outward from the borehole is minimal, with essentially no effect on the groundwater. (The only way to demonstrate that there is 'essentially no effect on the groundwater' is to establish baseline water quality before an intensive exploratory program and then sample after the exploratory phase to allow a before and after comparison of water samples. Until this is done, there is no scientific merit to their statement.) Well development flushes the mud filtrate from the area around the borehole, and is replaced by groundwater from the aquifer. This is the water that is sampled. In any case, determination of the area for which an aquifer exemption may be granted is based on whether or not the groundwater currently is used for human consumption, and that it will not be used for human consumption so long as the exemption is in place. (This is disturbing, "it will not be used for human consumption so long as the exemption is in place." This certainly sounds like they are approving the exemption for the aquifer because no one has a drinking water well in the area being explored by the mining company. It is unbelievable that the regulators in Texas believe that the company will restrict their contamination of the aquifer to their present footprint, and how is it that the aquifer is not designated as a drinking water source when people have wells that are proximal to the company exploratory holes. I don't know how close the nearest well is, but I'm sure you do.)**

I live less than five miles from the Uranium Energy Corporation's proposed Goliad Project site. My family and I live hydrologically degradient from the site. We had our water tested, as did seventeen of my rural neighbors, by the Texas Department of Health Services in Austin. All of our water is drinkable, and most of our wells are in "third sand". The report recorded with SEDAR, regarding the Goliad Project, reflects the opinion that the first sand is "nonconfined", but that the second, third and fourth sands are "confined". The confining clay and silt are above and below each defined unit. **As a matter of clarification, the terms used in hydrogeology are "confined" and "unconfined", although the term "nonconfined" obviously is synonymous with "unconfined." A confined aquifer is one in which the water level in a well completed in that aquifer will rise above the top of the aquifer. This is due to the pressure head in the water in that aquifer. In an unconfined aquifer, the water level**

in a well completed in that aquifer will be below the top of the aquifer. The situation in a confined aquifer is due to the presence of low permeability material, such as clay or shale, above and below the aquifer. For aquifers, the terms "confined" and "unconfined" do not refer to the lateral continuity of the aquifer.

My water well is 185 feet deep, in the third sand. If there are only confining clay/silt barriers above and below, dividing each sand layer, then what is to keep contaminated water from flowing laterally to my water well? **Under TCEQ rules, mining fluids must be confined to the zone where the minerals (in this case, uranium) occur, and to the area being mined. This is accomplished by the proper placement and operation of injection and recovery wells. More water is withdrawn than is injected (usually about 1% more). To further guard against injection fluids escaping from the zone being mined, each orebody is surrounded by a ring of monitor wells, which are sampled on a regular basis. (This is another fallacy that presents the illusion of the mining company protecting the groundwater down gradient. Check on the spacing of the monitor wells that form the ring. The NRC allows a spacing of 400 ft between monitor wells. Now, go check out the width of the creek that runs by your property. Are the active channels that show water flow wider than 400 ft? I bet they are not. When the fluvial sandstones in the Goliad where deposited, the system was comprised of many small meandering channels, like those you see in the present creeks draining the landscape. Because these channels contain the coarsest material, sand and gravel, they form preferential flow paths when the deposits are buried and become aquifers. Therefore, a ring of monitor wells with a spacing of 400 ft can completely miss a channel that is 100 ft wide and transporting contaminated water away from the mining zone. This is why every in situ mining site has contaminated water outside the ring of monitor wells. Check with the people who live around the URI Benavides amd Longoria ISL Mines in Duval County.) If any mining fluids are detected in a monitor well, the mine operator must take specific steps to correct the situation. Lastly, once mining is completed, the groundwater in the orebody is restored. (This statement is false and ignores the record of ISL mining at Benavides and Longoria, where the TCEQ had to relax restoration standards many times to allow the companies to say they had 'restored' the groundwater. Even with the relaxed standards, they could not restore the groundwater to initial levels of uranium. Note that the 'baseline' water quality for uranium, established by the mining company at Benavides and Longoria, was above the drinking water standard (reported as 0.037 to 0.12 mg/L). However, even when TCEQ relaxed the uranium restoration standard to as high as 1.5 mg/L, they could not met this uranium restoration goal. The final levels of uranium that were left in the aquifer where 2 to 3 mg/L, about 100 times greater than the drinking water standard.)**

I'm neither a hydrologist nor a hydrogeologist, but the State's approach to establishing a water quality baseline in the ore body of an aquifer after it has been disturbed is absurd. The Texas Railroad Commission MUST require a prerequisite water quality testing system PRIOR to the exploratory drilling. Any water testing subsequent to the exploratory drilling is "manufactured", and is not an accurate representation of the natural water quality. **As discussed earlier, groundwater samples used to determine baseline groundwater quality must be obtained from properly constructed wells. Groundwater sample collection must be done using procedures that will ensure a sample that is representative of the groundwater**

quality. Water quality samples are not collected from drilling mud in an exploration borehole. Also, as previously discussed, the effects of drilling on the aquifer are minimal, and would not result in the mobilization of constituents in the aquifer sediments. A review of the Uranium Energy Corporation (UEC) Class III well permit for their site near Weser in northern Goliad County (permit no. UR03075), indicates the overall quality of the groundwater as determined from samples obtained from the 20 baseline wells (5 wells in each of the four Goliad sands) is similar to the quality of the groundwater as determined from samples from 48 private wells in the vicinity, (Please request all groundwater analyses that were submitted by UEC to the TCEQ, as I would like to do a statistical analysis on the results. It is highly unlikely that UEC used the correct statistical procedures to establish baseline water quality.)all of which are completed in the Goliad Sand. The only exceptions are for uranium and radium 226, both of which are present in the groundwater from the baseline wells (all of which are completed in the ore zones) in significantly higher concentrations than in the surrounding private water wells. (Again, they cannot say that uranium and radium were elevated in the groundwater prior to the placement of hundreds of boreholes.) These baseline wells all were drilled and completed during the recent period from December, 2006 to June, 2007, whereas the private wells existed prior to UUCP's exploration drilling in the area.

I'll be traveling to Austin in the near future to address this issue at the Capitol Building. I hope to be able to visit with you and your colleagues at that time. **My staff and I would be happy to meet with you when you come to Austin in the near future. If you are unable to meet with us during that time, we can arrange to meet at another time if you wish. Please let me know when you would like to meet so that I can arrange for my staff and myself to be available. (It would be great if we could get all the information on groundwater analyses before you went to visit, that way you can present the results of our statistical analysis)**

Sincerely,

Mark Krueger
939 Noll Road
Meyersville, Texas 77974
(361) 485-1910
markkrueger@wildblue.net

----- Message from "Richard Abitz" <rabitz@cinci.rr.com> on Fri, 9 Nov 2007 08:30:12 -0500 -----

To: "'Mark Krueger'" <markkrueger@wildblue.net>

Subject: RE: ???

Mark:

As is often the case with a bureaucratic system, there is no clean statement to clarify the matter for citizens. The nuance comes down to whether the groundwater is considered a drinking water source. If it is a drinking water source, EPA will not approve the underground injection permit for the mining company. The company must have an underground injection permit to perform the mining, as chemicals

must be injected into the rock formation to extract the ore. Therefore, the chemical composition of the groundwater prior to mining needs to be determined and established before the mining companies come in and disturb the ore deposits. A common approach for the mining companies is to disturb the ore zone with exploration holes and then establish baseline conditions. The disturbance of the mining zone may introduce higher levels of Na, Cl, Ra, U, As, Mo and Se in their baseline groundwater samples, which is what they want to show the EPA the groundwater is not fit for human consumption. If they make the case to EPA that the water is not drinking water quality, EPA will issue an injection permit to the company. My urging you to have your water samples completely characterized for all drinking water parameters is based on this common, unprofessional approach that companies employ to obtain their underground injection permit. The closer a family well is to the proposed mining site, the more important it becomes to establish the drinking water quality of the aquifer.

The Nuclear Regulatory Commission (NRC) asked the US Geological Survey (USGS)to prepare a study on groundwater contamination associated with in situ uranium mining (NUREG/CR-6870, Consideration of Geochemical Issues in Groundwater Restoration at Uranium In Situ Leach Mining Facilities, January 2007). The USGS concluded that it was not possible to restore the aquifer to pre-mining conditions. Therefore, if you have drinking water quality, you will not get it back if in situ mining impacts your aquifer. This study is a thorn in the side of the NRC and mining companies, as it is the strongest independent statement for prohibiting in situ mining in a drinking water aquifer.

Regards,

Rich

From: Mark Krueger [mailto:markkrueger@wildblue.net]
Sent: Friday, November 09, 2007 7:50 AM
To: 'Richard Abitz'
Subject: ???

Rich,

I misstated that. I'm looking for an official government statement that "in situ mining is NOT fine if surrounding water is fit for consumption".

Thanks,
Mark

----- Message from "Richard Abitz" <rabitz@cinci.rr.com> on Sat, 10 Nov 2007 17:02:41 -0500 -----

To: "'Mark Krueger'" <markkrueger@wildblue.net>
Subject: RE: Absolutely ridiculous

Mark:

It is a confusing system that presents itself to the public. EPA does not control the permitting process for exploratory bore holes, the state does. Therefore, the state needs to step in and require the companies to establish baseline conditions before they riddle the aquifer with exploratory drilling. EPA comes into the picture in the later stages of the process, after the company decides to proceed with mining and applies to EPA for an injection permit. EPA would deny the permit if the groundwater met the chemical criteria for drinking water and was a drinking water source for the community. Obviously, the groundwater has less chance of meeting the drinking water criteria after hundreds of drill holes have been placed into the Goliad Formation.

An aquifer is said to be confined or unconfined, and the discussion below implies that they are dividing sand zones in the Goliad into separate aquifers. I am not a hydrologist, but I would think that if the silty

clay between the sands are saturated with water, which they most probably are, then the entire formation would be one aquifer. However, because the hydraulic conductivity is greater in the sands, hydrologists may divide these zones into their own aquifers. That being said, you are correct to assume that water will travel laterally through the sands, and this travel is faster than travel in the silty clay. The difference in hydraulic conductivity between the sands and silty clay horizons is one of the primary reasons why in situ mining is impossible to control. Companies make the assumption that hydraulic conductivity is the same in every direction within the aquifer, when clearly it is not. Aquifer sediments tend to be heterogeneous, and this makes it very difficult for the companies to control the extraction of the pregnant lixiviant. Eventually, this toxic plume escapes the mining zone and begins to migrate away from the mining site. This escaping plume is called an excursion, and every in situ operation has them.

There are so many incomprehensible things associated with in situ mining in a drinking water aquifer, and I simply do not understand how politicians allow this in a community water supply. Clearly, your activism, along with your neighbors, is all you can count on.

Rich

From: Mark Krueger [mailto:markkrueger@wildblue.net]
Sent: Friday, November 09, 2007 11:14 PM
To: 'Richard Abitz'
Subject: Absolutely ridiculous

Rich,

Are you telling me is that the mining companies are allowed by the EPA to stir up the aquifer, increase the toxin levels above MCL, then use that as a baseline? That's absurd. Are the people in our government really that stupid? I really think I'm going to have to go to Austin to talk to somebody about this.

I read the SEDAR NI 43-101 Technical Report on the Goliad Project. Dr. Carothers states that only the upper sand is unconfined, but the three lower sands are confined. So, now we can segregate zones in one aquifer? Isn't an aquifer either confined or unconfined? Also, if my well is in third sand, and the confining clay is above and below the third sand, what is to keep the water from traveling laterally to my well? This is part of the report::

"

7.2 Local and Property Geology

The surface of the property is all within the outcrop area of the Goliad Formation. The mineralized units are sands and sandstone within the Goliad and are designated by UEC as the A through D sands from younger (upper) to older (lower), respectively. The sand units are generally fine to medium grained sands with silt and varying amounts of secondary calcite. The sand units vary in color depending upon the degree of oxidationreduction and could be from light brown-tan to grays. The sands units are generally separated from each other by silty clay or clayey silts that serve as confining units between the sand units.

The Goliad Formation at the project site occurs from the surface to a depth of about 500

feet. Depending upon the land surface elevation groundwater occurs in the sands of the formation below depths of about 30 to 60 feet. The four sand/sandstone zones (A-D) designated as containing uranium mineralization at the site are all considered to be a part of the Gulf Coast Aquifer on a regional basis. At the project area however, each zone is a hydrogeologic unit with similar but variable characteristics. The A zone is the uppermost unit and based on resistance logs, groundwater in this unit may be unconfined over portions of the site. The three deeper zones are confined units with confining clays and silts above and below the water-bearing unit.

Groundwater from sands of the Goliad Formation is used for water supplies over much of the northern portion of Goliad County. Water quality in the Goliad is variable and wells typically can yield small to moderate amounts of water according to Dale (1957). Data in this reference indicates an approximate average hydraulic conductivity of the waterbearing zones of the Goliad formation in Goliad County is 100 gallons per day per square foot. Based on this value, a 20 foot sand unit would have an approximate transmissivity of 2,000 gallons per day per foot. With sufficient available drawdown, properly completed ISR wells could have average yields in the range of 25 to 50 gallons per minute.

The hydrogeologic characteristics of the water-bearing sands at the Goliad Project have not been determined yet, but aquifer tests are required prior to submitting a mining permit 7-2
application. Hydrogeologic tests will determine the hydraulic character of the sands and the confining beds separating the individual sand zones.

The site area structures include two faults that intersect and offset the mineralized units. These faults are normal, with one downthrown toward the coast and one downthrown toward the northwest. The fault throws range from about 40 to 80 feet.

----- Message from "David Murry" <DMURRY@tceq.state.tx.us> on Mon, 26 Nov 2007 16:12:01 -0500 -----

To: "Mark Krueger" <markkrueger@wildblue.net>

cc: "Ben Knape" <BKNAPE@tceq.state.tx.us>, "Katherine Nelson" <KNELSON@tceq.state.tx.us>

Subject: Re: Impact Statement

Dear Mr. Krueger;

An environmental impact statement is not required for this type of application. What is required is that an applicant demostrate they meet the applicable requirements in Chapter 331 of Title 30 of the Texas Administrative Code.

David Murry
512-239-6080

>>> "Mark Krueger" <markkrueger@wildblue.net> 11/24/2007 10:09 AM >>>
David,

Where can I find the Environmental Impact Statement prepared by the company?

Thanks,
Mark Krueger

----- Message from "David Murry" <DMURRY@tceq.state.tx.us> on Sat, 17 Nov 2007 13:31:47 -0500 -----

To: "Mark Krueger" <markkrueger@wildblue.net>
cc: "Katherine Nelson" <KNELSON@tceq.state.tx.us>
Subject: Re: Monitor Wells

Dear Mr. Krueger,

Yes, Katherine obviously meant to forward you e-mail to me so that I could answer your questions. Thanks for sending it to me. Please find below responses, in bold, to your questions.

I have referenced some specific regulations just to let you know where these requirements are in our rules. Our rules are under Title 30 of the Texas Administrative Code (this is usually abbreviated as 30 TAC). Rules for in situ uranium mining are in Chapter 331. Rules for excursions in Class III injection wells are in sections 105 and 106 of Chapter 331 (this is abbreviated as §331.105 and §331.106). So, references to these rules would be written as 30 TAC §331.105 and §331.106. All of the 30 TAC rules can be viewed online at:

http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC

I know this all sounds regulatory and maybe a little bureaucratic, but this is how the rules are set up. Once a person gets accustomed to it, it is not so bad. Also, this allows a person to read the actual regulation.

If an excursion is detected, what specific steps are taken to prevent it from further migrating? If the monitor wells are 400 feet apart, how will they detect an escape in a narrow channel? Coleto Creek certainly isn't 400 feet wide, so it seems that the channels underneath it would be comparable.

Under 30 TAC §331.105, monitor wells must be sampled twice a month, with sampling events at least two weeks apart. The water samples must be analyzed for the control parameters within 2 working days. This is done during mining and during restoration. If the result of a sample analysis indicates a control parameter is present above the upper limit, the mine operator must sample that well again to verify the original result. The verifying sample must be analyzed within two days. If the excursion is verified by the second sample, the sampling frequency is increased to a minimum of twice a week.

When a mine operator verifies that an excursion has occurred, they are subject to the requirements of §331.106. Under these rules, they must notify the TCEQ by telephone the next working day, followed by written notification within 48 hours. They must then complete a groundwater analysis for each affected well and submit the results to the

TCEQ. The mine operator must take steps to identify the extent of the excursion, and must initiate action to clean up the excursion.

Sand in the subsurface can be restricted to channels, although this does not appear to be the case for the sands in the Goliad Formation. The applicant is required to include in the application an evaluation of the subsurface conditions at the site. TCEQ staff (in this case, me) review and evaluate the geologic information submitted in the application. This includes the geophysical logs for 64 exploration wells (these are in Appendix D of the application) UEC used to construct geologic cross sections for the site. Under §331.106, monitor well spacing can be no greater than 400 feet. If warranted, the TCEQ can require closer spacing. This would depend on the nature of the sands to be mined. If these sands occurred in restricted channels, we would require closer monitor well spacing.

I don't mean to be a pain in the neck, but again, I'm almost directly degradient from this site, and I don't want my 11-yer-old stepdaughter to end up having children with no fingers or toes, or die from cancer at 21, because somebody screws up at the mine or any other reason. I need to be comfortable with this situation, and as of now I am not. This is very frightening.

Neither Katherine nor I live in the vicinity of a proposed uranium in situ mining operation, so we obviously cannot completely appreciate your position. However, we certainly respect your concerns, and we are happy to answer your questions and to provide information as we can. Please do not hesitate to contact us.

Sincerely,

David Murry
512-23-6080

>>> "Mark Krueger" <markkrueger@wildblue.net> 11/16/2007 4:27 PM >>>
David,

I guess she accidentally sent it to me instead of you. I do have a couple of more questions, though:

If an excursion is detected, what specific steps are taken to prevent it from further migrating? If the monitor wells are 400 feet apart, how will they detect an escape in a narrow channel? Coleto Creek certainly isn't 400 feet wide, so it seems that the channels underneath it would be comparable.

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I did go to Goliad today and got copies of the water test results from Appendix A. Thanks for the direction.

Thanks,

Mark Krueger Re Underground flow.htm

----- Message from "Richard Abitz" <rabitz@cinci.rr.com> on Tue, 27 Nov 2007 12:01:49 -0500 -----

To: "'Mark Krueger'" <markkrueger@wildblue.net>

Subject: water quality

Mark:

The enclosed spreadsheet has the summary of the water quality data you sent. This is the format we need to manipulate the data, so additional analyses you receive should be entered into this sheet, and send an updated version to me.

All private wells exceed the primary drinking water standard of 500 mg/L for total dissolved solids (TDS), with the exception of Hausman 2, Martin 1, Obluntzer 1 and Wesselman 1. I believe the secondary drinking water standard for TDS is 1000 mg/L, and Braquet 1, Braquet 2, Halepaska1, Jacobs 1, St Peters 2, Tolbert 3 and Walker 1 exceed this limit.

Walker 1 exceeds the primary drinking standard for sulfate (250 mg/L) and Braquet 1, Breeden 2, Helepaska 1, Jacobs 1, St Peters 2 and Tolbert 3 exceed the primary standard for chlorine (250 mg/L).

However, the greatest concern lies with wells that exceed the radium-226 primary standard of 5 pCi/L, and these wells are Braquet 1, Breeden 1, Breeden 2 and Tolbert 3.

All of the ore zone wells exceed the drinking water standard for radium, and most exceed the standard for uranium. Radium levels are elevated due to low sulfate and high chloride values, and evidence of some ore oxidation. Based on the uranium results, the deposits appear to be in a semi-oxidized state, with some wells showing evidence of stronger oxidation (those wells with elevated As and Mo results). Oxidation could be due to recharge water that is oxidizing or to disturbance of the ore zone by exploration borings.

There is much more information we need to gather to perform a more detailed assessment of the water quality in private and ore-zone wells. First, we need a map that shows the location of all the wells (this is important to evaluate proximity of private wells to exploratory borings and to determine their logic for placing the wells that represent the water quality in the ore zone). Second, a drilling log for each well that indicates the interval of the well that is screened to allow water into the well (this is very important for the ore-zone wells, as we need to know if they sampled from a thin ore zone or sampled across the entire thickness of the sand unit. It is also important for private wells because we need to know the screen depth to group wells for statistical calculations). Third, why were all the private wells sampled in the winter of 2006-07 and ore zones sampled in the winter and summer of 2007? (this is important because we need to establish how many exploration borings were placed before winter 2007 and before summer 2007)

I can perform some preliminary statistical calculations on the ore-zone wells that were sampled in the same time frame (winter or summer), as I believe the A, B, C and D at the end of the RBL identifier implies Sand A, Sand B, etc. That is, they are from the same horizon in the aquifer. This cannot be done for the private wells because I do not have the information on what horizon the water is being pulled from.

I'll be in touch,

Rich GoliadISL.xls